GEOMATICS - BACHELOR OF SCIENCE IN GEOMATICS

Geomatics (https://et.nmsu.edu/academics%20/geomatics-surveying.html) is a rapidly developing engineering discipline that focuses on acquiring and analyzing precise spatial information. Geomatics engineers use a variety of technologies such as Unmanned Aerial Vehicles, Global Navigation Satellite Systems, High-Definition 3D Laser scanners, High-resolution satellite images, and Geographic Information Systems. They measure terrestrial and three-dimensional positions of points on, above, and below the earth's surface and the distance and angles between them at a high level of precision. Geomatics engineers aid in the design of infrastructure including roads, bridges and legal boundaries for ownership. They provide precise data for natural resource managers, subdivision developers, and coastal monitoring systems.

The program is designed to provide cutting-edge industrial needs as well as to meet the educational requirements for registration as a Professional Land Surveyor in different states.

The mission of the Department of ETSE is to provide men and women with the rigorous, fundamental education needed to enter and succeed in the Geomatics and related professions. To accomplish this mission, the department will introduce students to the theory and application of recognized geomatics principles. The Geomatics degree is offered online. Students can start as freshmen or transfer.

Requirements (120 Credits)

Students must complete all University degree requirements, which include General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

Students must also take the Fundamentals of Surveying examination before graduation.

Prefix	Title	Credits
General Education		
Area I: Communications [1]		*10*
English Composition - Level 1		
English Composition - Level 2		
Oral Communication		
Area II: Mathematics [1]		*3-4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1435	Applications of Calculus I	
Area III: Laboratory Sciences [1]		*8*
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
or PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
One additional Area III: Laboratory Sciences for 4 credits [1]		
Area IV: Social and Behavioral Sciences [1]		*3*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
MATH 1521G	Calculus and Analytic Geometry II [2]	
or MATH 1440	Applications of Calculus II	
Viewing A Wider World [1]		*6*
Departmental/College Requirements		
Students can start as freshmen or transfer into the Geomatics program. Technical transferrable and non-transferrable courses are listed below. [3, 4]		
Subject-Matter Courses [3, 4]		*21-24*
Computer Drafting (such as E T 109)		
Computer Programming (such as ICT 152 or C S 172)		
Two Courses on Geographic Information Systems (such as GEOG 381 and GEOG 481)		
Plane Surveying (such as SUR 222)		
Statistics (level 200 or above, such as A ST 311)		
Surveying/Civil Drafting (such as E T 143)		
Required Courses		*48*
BLAW 316	Legal Environment of Business	
or BLAW 325	Real Estate Principles and Law I	
E T 355	Site/Land Development and Layout	
I E 451	Engineering Economy	
SUR 285	Precise Digital Mapping	
SUR 292	Legal Principles and Boundary Law I	
SUR 312	Public Land Survey System Boundaries	
SUR 328	Construction Surveying & Automation Technologies	
SUR 351	Spatial Data Adjustment I	
SUR 361	Geodesy/Geodetic Control Surveying	
SUR 401	Ethics and Professionalism in Surveying and Mapping	
SUR 450	Senior Project	
SUR 451	Spatial Data Adjustment II	
SUR 452	Surveying Practicum	
SUR 461	GNSS Positioning	
SUR 464	Legal Principles and Boundary Law II	
SUR 485	Emerging Techniques in Geospatial Technologies	
Second Language: (not required)		
Electives, to bring the total credits to 120		**12-7**
Total Credits		**120**

1. See the General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/) section of the catalog for a full list of courses. See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of this catalog for a full list of courses.
2. Mathematics courses require math placement or taking prerequisites before enrollment.
3. Transfer students must complete college-level work that includes General Education Area I, IV, V, and VI (19 credit: see the General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of this catalog for a full list of courses), Calculus I and II (6-8 credits), Physics I (4 credits), elective science with lab (4 credits), computer drafting (3 credits), statistics (3 credits, 200-level of above), computer programming (3-4 credits),plane surveying (3 credits), introduction to GIS (6-8 credits), surveying/civil drafting (3 credits), and approved electives to bring total transfer credits to 66.

[4] Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their academic advisor.

A Suggested Plan of Study for Students

The contents and order of this roadmap may vary depending on the students' transfer credits, some courses may need to be completed in addition to the ones listed below. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
Transfer 33 Credits [1, 2, 3, 4]		33
	Credits	**33**
Second Year		
Transfer 33 Credits [1, 2, 3, 4]		33
	Credits	**33**
Third Year		
Fall		
BLAW 316 or BLAW 325	Legal Environment of Business or Real Estate Principles and Law I	3
SUR 292	Legal Principles and Boundary Law I	3
SUR 361	Geodesy/Geodetic Control Surveying	3
Viewing a Wider World [1]		3
	Credits	**12**
Spring		
E T 355	Site/Land Development and Layout	3
SUR 285	Precise Digital Mapping	3
SUR 312	Public Land Survey System Boundaries	3
SUR 328	Construction Surveying & Automation Technologies	3
SUR 351	Spatial Data Adjustment I	3
	Credits	**15**
Fourth Year		
Fall		
I E 451	Engineering Economy	3
SUR 401	Ethics and Professionalism in Surveying and Mapping	3
SUR 451	Spatial Data Adjustment II	3
SUR 464	Legal Principles and Boundary Law II	3
SUR 485	Emerging Techniques in Geospatial Technologies	3
	Credits	**15**
Spring		
SUR 450	Senior Project	3
SUR 452	Surveying Practicum	3
SUR 461	GNSS Positioning	3
Viewing a Wider World [1]		3
	Credits	**12**
	Total Credits	**120**

[1] See the General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of this catalog for a full list of courses. See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of this catalog for a full list of courses.

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